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## NATURAL HISTORY MISCELLANY.

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### BOTANY.

LARGER BUR-MARIGOLD.—In the last edition of the "Manual," Prof. Gray ascribes to *Bidens chrysanthemoides* a maximum height of two and a half feet. The writer has recently observed this species growing to the prodigious height of from six to eight and two-thirds feet. The locality of these large specimens is near a spring in Pratt Co., Illinois. We tried to trace in these overgrown plants evidences of hybridization with *B. frondosa*, which was growing in the same spot, but could detect none in either leaves, flowers or fruit. Lest the mere record of such a remarkable growth should seem incredible to some, we preserved a specimen measuring eight feet eight inches; stripping it of its branches, of course, except a few terminal ones bearing leaves and flowers sufficient for identification. The species in question almost always surpasses in this district the maximum size allowed it by our authors, as indeed do many other plants. I should add that the specimens of *B. frondosa* of the locality referred to were equally as tall but *not taller* than those of *B. chrysanthemoides*. *Panicum crus-galli* Linn. grows in our low prairies (apparently indigenous) to the height of six or seven feet; and *Lysimachia ciliata* to from three to five, rather than "two to three," as Professor Gray says. But scores of other species might be mentioned which seem constantly to outgrow themselves on our western soils. The flora of the United States as it is now known seems remarkable for various forms of the same species; and although future studies will probably identify as distinct species many forms now regarded as only varieties, yet remarkable differences in the size of the same species in different localities will be a more notable feature of our flora when the plants of the east and the west, the north and the south, shall have been more thoroughly studied and more diligently compared.—EDWARD L. GREENE, *Decatur, Illinois*.

THE YELLOW-FLOWERED SARRACENIA PURPUREA.—The remarks of Mr. Tracy, on page 327 of the NATURALIST, have somewhat surprised me, as the form of *Sarracenia purpurea* L., there described, though rather rare, has been long and well known. (See Gray's Manual, etc.) This is, I presume, no other than the *S. heterophylla* Eaton, and *S. purpurea*, var. *heterophylla* Torr. Under the latter name, Wood, in describing it says it has been found at Northampton, Mass. It may be interesting to state in this connection, as showing its distribution, that I collected this form (a specimen of which I preserve in my herbarium) more than two years ago, on the south shore of Lake Superior, about thirty miles east of Marquette, Michigan. It grew with the common form. In my plant the leaves were without purple veins, or had them but very few and pale.

As to its being a transition state, on its way to full whiteness, that is a point open to question. I do not know that the flower has ever been found white.

Those who so strongly insist on the relation of vital force to color would seem to be sustained in this one fact, that in almost all white varieties (white being taken as absence of color) the foliage, stem, sepals, etc., appear to sympathize, and are at least much paler than usual. But this will not be admitted as conclusive. — HENRY GILLMAN, *Detroit, Mich.*

AREAS OF PRESERVATION. — Although distribution is one of the strongest points of the derivative doctrine, yet it is wonderful to see, in the light of this sober and impartial survey [Bentham's address on Geographical Biology to the Linnæan Society, 1869], how entirely the whole aspect of philosophical natural history in this regard has changed within two decades. "Centres of creation" and the like are of the language of the past, here replaced by Bentham's happy term of "Areas of Preservation." And the conclusion tardily reached "that the present geographical distribution of plants was in most instances a derivative one, altered from a very different former distribution," has been followed by the conviction that the present species themselves are equally derivative, and have a changeful history, some steps in which may be dimly surmised by the study of cognate forms, extant or fossil. At the point now reached, if not by general yet by large consent, the problems we are led to consider are such that it is indispensable to have a term of wider application than "species" technically means; and Mr. Bentham here appropriates to this use the word *Race*, to denote either permanent variety (the old meaning of the word when definitely restricted), or species, or groups of two or more near and so-called representative species, *i. e.*, for those collections of individuals, or resembling groups of individuals, whose association in the way of lineage is taken for granted by this class — or rather by these classes — of naturalists. As the term was only beginning to get fixity in its restricted sense, it will take the wider sense without confusion or difficulty, and with the advantage of a vernacular instead of a newly coined purely technical word. — A. GRAY, in *American Journal of Science*.

LEAVES OF CONIFERÆ. — At the meeting of the Philadelphia Academy of Natural Sciences on the 5th of January, Thomas Meehan referred to his original observations that the so-called leaves of pines were rather branchlets than leaves, and that the true leaves existed in the shape of scales which were adnate to the stem; and that these adnate leaves were partially free or adherent in proportion to the axial vigor of the tree. In some Coniferæ, the larch being a good illustration, the adherent leaves or scales, had the power of producing long foliaceous awns, which appeared as true leaves. Nothing of this kind had been found in *Pinus* except in the one-year-old or seedling state. He now exhibited a specimen of *Pinus serotina*, which had been sent him by Mr. W. H. Ravenel, of Aiken, South Carolina, in which foliaceous awns, two inches long, had been

developed from these adnate leaves, under each fascicle of branchlets (forming 3-leaved fascicles). This he thought demonstrated in a more remarkable manner than any observations he had yet made, the soundness of his former deductions.

He called attention to the value of these adnate leaves in affording specific characters. They differed in form and other points nearly as much from one another as the leaves of other tribes or plants. He exhibited living specimens of *Pinus Austriaca*, *P. sylvestris*, *P. maritima*, *P. rigida*, *P. pungens*, *P. mitis* and *P. glabra* Walk., to illustrate this. Some were costate, some regularly plane, others elongated, linear, ovate, obtuse, acute, regular, oblique, spathulate, gibbous, etc., etc. *Pinus glabra*, which had been confused with *P. mitis*, could readily be distinguished by these adnate leaves; and any pine could be as readily known and in some instances better known, by the adnate leaves, than the minute and often almost inappreciable difference founded on the old time leaves (fascicled branchlets) and cones.

NOTES FROM CHICAGO. — Chicago has a flourishing young botanical society, the members of which meet on the first and third Saturday of each month. They have engraved upon their official seal the *Dioscorea villosa*, considering it the prettiest native twiner in this part of the country.

The flowers of the prairies are no prettier than the flowers of New York and Massachusetts. The variety is not so great; but on account of the absence of trees and shrubs some species are represented by very large numbers of specimens, making a grander display which is noticed by everybody. — W. J. B.

PHOTOGRAPHY IN BOTANY. — To illustrate venation and the nature of the surface of foliage photography may be turned to good account, far more than is now commonly thought of. We have seen a photograph from a specimen of one of the coriaceous-leaved oaks of the Dutch Indies which was truly wonderful in its rendering. — A. GRAY, in *American Journal of Science*.

[Photography in Entomology will prove of great benefit, especially in representing, with accuracy, the venation of the wings of the Hymenoptera, Lepidoptera and Diptera. We value very highly certain photographs taken for us several years ago by Professor A. E. Verrill; and Mr. Carl Meinerth of Newburyport, Mass., has taken some exceedingly good pictures of Hymenoptera and Moths. The venation of insects is exceedingly difficult to represent by the pencil, even of a facile and skilled entomologist. — EDITORS.]

TRANSFORMATIONS OF PARTS OF FLOWERS. — Professor Koch has found that in a fruit of *Solanum melongena*, the five anthers have been transformed into five smaller capsules. A capsule of poppy offers, in the centre of its cavity, a small elevation (the continuation of the axis), bearing a number of smaller capsules. — *Nature*.

**FERTILIZATION OF PLANTS.**—Professor Hildebrand states that plants intermediate between the Papaveraceæ and the Fumariæ gave the greatest quantity of seeds when impregnated with the pollen of another individual of the same species; less when the pollen was taken from another flower of the same individual, and least when the impregnation took place within the flower itself. For *Eschscholtzia Californica*, the proportion of seeds in these three cases was as twenty-four to nine to six. Professor Fewzl says that he obtained abundance of seeds from two species of *Abutilon* by fecundation with pollen from other individuals, and that these operations are best performed between eight and nine A.M.—*Nature*.

**IN FOURS.**—In the September number of the *NATURALIST*, G. F. M. mentions a *Trillium erythrocarpum* having its parts in fours. I have in my collection a similar specimen of *T. sessile*, found on the Salamonie. Also a specimen of *T. recurvatum* from the same locality, having its parts in twos; two leaves, sepals, petals and stigmas, and four stamens.

In the November number, C. J. S. speaks of a specimen of *Zea Mays*, where the floral organs have changed offices. I have often observed this freak in the fields; grains among the staminate flowers, and staminate flowers surmounting the rachis. I have also seen the entire fascicle of staminate flowers transformed into a tuft of little green blades.—R. H. FISHER, *Arba, Indiana*.

**ANDROGYNOUS INFLORESCENCE.**—Such inflorescences have been found on *Zea*, *Populus*, *Fagus*, *Carpinus*, *Betula humilis* and *B. alba*, as also on *Pinus nigra*; the small scale, considered as a part of the female blossom, developing itself into an anther.—*Nature*.

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## ZOOLOGY.

**RELATION OF THE PHYSICAL TO THE BIOLOGICAL SCIENCES.**—With reference to those branches of science in which we are more or less concerned with the phenomena of life, my own studies give me no right to address you. I regret this the less because my predecessor and my probable successor in the presidential chair are both of well-known eminence in this department. But I hope I may be permitted, as a physicist, and viewing the question from the physical side, to express to you my views as to the relation which the physical bear to the biological sciences.

No other physical science has been brought to such perfection as mechanics; and in mechanics we have long been familiar with the idea of the perfect generality of its laws, of their applicability to bodies organic as well as inorganic, living as well as dead. Thus in a railway collision, when a train is suddenly arrested the passengers are thrown forward, by virtue of the inertia of their bodies, precisely according to the laws which regulate the motion of dead matter. So trite has the idea